BROADCAST tools INC

Installation and Operation Manual

Site Sentinel® 16

Web Enabled Sixteen Channel Site Remote Control System

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NOTE: We recommend the use of Firefox or Safari for Windows as your browser.

Manual update: July 1, 2010
For firmware versions equal to or greater than SS16X_V1.14 / SS16W_V1.14 / SS16P_V1.05
If you need a firmware upgrade, contact Broadcast Tools®

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INTRODUCTION

Thank you for your purchase of Broadcast Tools® Site Sentinel® 16 Web based 16 Channel Site Remote Control System (referred to as the Site Sentinel® 16 throughout this manual). We're confident that this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the Broadcast Tools® Site Sentinel® 16.

SAFETY INFORMATION

Only qualified technical personnel should install the Site Sentinel® 16. Any attempt to install this device by a person who is not technically qualified could result in a hazardous condition to the installer or other personnel, and/or damage to the Site Sentinel® 16 or other equipment. Broadcast transmitters can operate at voltages that are potentially lethal. Please ensure that proper safety precautions have been made before installing this device. If you are unfamiliar with this type of equipment, please contact a properly qualified engineer to handle the installation and setup of the Site Sentinel® 16.

Broadcast Tools® Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure. Serious injury or death can occur if a command channel is activated while you are performing maintenance on your equipment. If you are performing maintenance on your equipment, you should press the "LOCAL" button on the front panel of your Site Sentinel® 16 forcing the unit in to local mode. The "LOCAL" LED will illuminate. Local mode prevents the unit from performing relay commands.

For additional safety, it is strongly recommended that, in addition to setting the Site Sentinel® 16 in to "LOCAL" mode, the remote/local switch on any transmitter or high voltage equipment should also be set to local mode.

While the Site Sentinel® 16 relays are physically capable of handling 250 VAC, this practice is extremely dangerous and should never be attempted. The removable euroblock screw terminals are not designed to shield humans from potentially dangerous voltages. Contact with high voltages can cause serious injury or death. The maximum recommended voltage for the Site Sentinel® 16 is 30V. Switching of high voltages should only be done external from the Site Sentinel® 16 and in a manner that isolates the voltages from accidental contact with humans.

WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

Broadcast Tools, Inc.
131 State Street
Sedro-Woolley, WA 98284-1540 USA
Voice: 360.854.9559
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Internet Home Page: www.broadcasttools.com
E-mail: support@broadcasttools.com

THANK YOU FOR CHOOSING
BROADCAST TOOLS® BRAND PRODUCTS!

NOTE:

This manual should be read thoroughly before installation and operation.

Find a contract Broadcast Engineer in your area? Check out this link: http://www.sbe.org/CCE_List.php

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PRODUCT OVERVIEW

The Site Sentinel® 16 is a robust, full-featured; web-enabled sixteen channel remote control system. The system is equipped with 16 - 12-bit resolution, zero to 10 vdc metering channels; four virtual metering channels; 16 optically-isolated status (logic) inputs, 33 programmable SPDT relays which may be configured for ON, OFF and pulsed operation; four temperature probe inputs; one internal temperature monitor; stereo silence sensor and power failure input. The Site Sentinel® 16 was designed so all of the basic functionality you need is included to monitor and control your site equipment, including user programmable event action (macro) sequencer. Each input channel and all relays can be controlled and/or monitored over any IP network including private networks, IP-based industrial control network and the Internet. Users can operate the product using a web browser or web-enabled mobile device, while email notification may be configured to alert up to EIGHT recipients when alarms are detected. The user may also enable a sound effect to play on the monitoring PC when an alarm is generated. Logging of all user selected input status with site ID information which may be emailed from once an hour to once a day, along with hourly snap-shot functionality. We have also provided SNMP capabilities to allow multiple units to be monitored with any SMNP manager software package. SMTP username and passwords are also supported.

Additional features include; power controller port. By pairing this feature with an optional external AC power control unit (such as the Mid-Atlantic RLM-15-1C, RLM-20-1C or RLM30-L530-1), remote rebooting of AC powered equipment is possible.

Features/Benefits

• NTP time base and/or battery-backed real time clock/calendar with accurately better than +/- 3 minutes per year.
• Four “Virtual” metering channels.*
• Four temperature ports allowing Fahrenheit or Celsius temperature monitoring within the range of -67°F to +257°F (-55°C TO +125°C).*
• Internal temperature monitor.*
• Jack for external power failure power supply.*
• Stereo Silence Sensor monitoring.*
• Event-driven and time-based automatic command capabilities. This allows user-defined macros to enable the Site Sentinel® 16 to make corrective actions.
• 100-event program scheduler for relay control and alarm muting.
• Logging of all user selected input status with site ID information which may be emailed from once an hour to once a day, along with hourly snap-shot functionality.
• Fifty-two front panel I/O activity LED indicators.
• Front panel local/operate switch with LED indicator.
• Plug-in euro-block screw terminals for metering, status, relays, temperature and stereo silence sensor.
• Rear panel RJ-45, 10/100base-T LAN/Ethernet interface.
• Fused and surge protected universal power supply included.
• Fully RFI proofed.
• One rack-unit chassis.

*** Denotes independent of the metering (analog) and status/logic channels.**

INSPECTION

Please examine your Site Sentinel® 16 carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately and retain the packaging for inspection by the shipper. The package should contain the Site Sentinel® 16, this manual and/or CD, 7 foot BLUE straight-through CAT 5 cable, 7 foot GRAY crossover CAT 5 cable and the universal regulated 12 VDC @ 2.5 amp power supply with domestic IEC power ac cord.

INSTALLATION

Surge Protection

The Site Sentinel® 16 has built-in resistance to voltage changes, we recommend that you use a power surge protector or line conditioner on the incoming AC line. Lightning strikes and other high surges in voltage levels will damage your Site Sentinel® 16 and connected equipment if it is not properly protected. For lightning protection devices, check out www.polyphaser.com and www.itwlinx.com.

UPS Standby Power System

We recommend that you connect your Site Sentinel® 16 to a UPS system. While all operating and user parameters are stored in non-volatile EEPROM, brownout conditions and lightning induced spikes can disable or damage equipment. A UPS helps minimize the risk to the Site Sentinel® 16 and has the added benefit that it will then be able to notify you of the power outage by email.

Front panel indicators and controls

Name	Type	Description
Lower relays	16 LED's	Illuminates when the corresponding relays are activated.
Raise relays	16 LED's	Illuminates when the corresponding relays are activated.
Status Inputs	16 LED's	Illuminates when the corresponding status/logic inputs are activated. May be configured for reverse logic.
PWR CNTR	LED	Illuminated when the relay is activated.
SS	LED	Illuminated when adequate audio is applied to the SS Input(s), OFF when the level is too low and flashing if in an SS alarm condition, if enabled.
PF	LED	Illuminated when power is applied, OFF when inadequate DC voltage is applied to the PF jack and flashing if a Power Failure has been detected, if enabled.
POWER	LED	Illuminated when valid power is applied to the power jack.
LOCAL	Push Button	Toggles between operate and local mode.
LOCAL	LED	Illuminated when the unit is in local mode (relays disabled).
Blank hole	Push Button	Recessed push button used to reload factory defaults.

CAUTION!

Installation of the Site Sentinel® 16 in high RF environments should be performed with care. Shielded cable is suggested for all monitoring and control connections with all shields tied to the station/site ground terminal. The station/site ground should be connected to either of the rear panel (Chs Gnd) chassis 6-32 screws using an 18 or 20-gauge wire.

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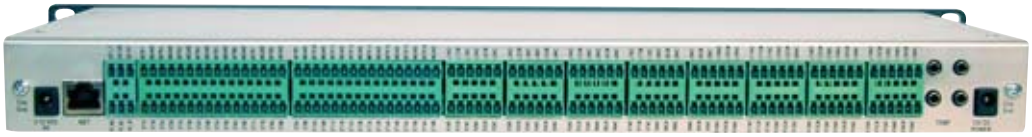
Rear panel indicators and controls



Name	Type	Description
Chs Gnd	6-32 screw	Chassis ground screw. Tie to station/site ground system.
PF	2.1mm Jack	Power failure power jack (optically-isolated). 5 -12 VDC @ 15 ma power supply optional.
NET	Connector	RJ45 network connector.
SSLT	Connector	Unbalanced Silence Sensor left audio input (Top).
SS GD	Connector	Silence Sensor audio ground (Top).
SSRT	Connector	Unbalanced Silence Sensor right audio input (Top).
		NOTE: Left and right electronically summed to monaural internally.
PCNO	Connector	Power controller normally open relay contact (Bottom).
PCNC	Connector	Power controller normally closed relay contact (Bottom).
PCJP	Connector	Power controller internal function jumper (Bottom).
MTR 1-16	Connector	Metering (analog) inputs one thru sixteen (Top).
MGND	Connector	Metering (analog) ground reference terminal (Top).
ST1A - 16A	Connector	Status/logic opto-isolators. When configured for DRY, (factory default) this terminal is ground. When configured for WET (floating), this terminal is the anode via a 2.2K ohm current limiting resistor (Bottom).
ST1B - 16B	Connector	Status/logic opto-isolators. This terminal is always the cathode (Bottom).
L1NO–L16NO	Connector	Lower Normally Open, dry relay contacts (Top).
L1CM-L16CM	Connector	Lower CoMmon (wiper), dry relay contact (Top).
L1NC-L16NC	Connector	Lower Normally Closed, dry relay contact (Top).
R1NO-R16NO	Connector	Raise Normally Open, dry relay contacts (Bottom).
R1CM-R16CM	Connector	Raise CoMmon (wiper), dry relay contact (Bottom).
R1NC-R16NC	Connector	Raise Normally Closed, dry relay contact (Bottom).
TEMP		3.5mm Jack Temperature probe input jacks. 1/8” (3.5mm) T/R/S mini-jacks. One probe supplied. (Top/Bottom).
12VDC Power	2.1mm Jack	System power supply input. 12 volt DC @ 2.5 amp.
		NOTE: Center positive.
Chs Gnd	6-32 screw	Chassis ground screw. Tie to station/site ground system.

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Connecting your Site Sentinel® 16 to external equipment.

NOTE: The Site Sentinel 16 interfaces to external equipment through removable euroblock screw terminals. The terminals accommodate wire sizes from 16 - 28 AWG solid or stranded wire. Before installing a wire, remove the euroblock screw terminal plug and turn each capture screw fully counterclockwise. Strip each conductor to a length of 0.25" and insert the conductor fully into the terminal. Turn the capture screw fully clockwise to secure the conductor.

Chs Gnd screws

Either 6-32 screws MUST be connected to the station/site ground system for the proper operation of this equipment.

Power Failure Input

Connect a user supplied 5 to 12 volts DC only power source (center positive) to the power failure input labeled PF. The barrel connector size is 2.1mm ID x 5.5mm OD. A 5 to 12 volts DC wall transformer of any current of 25 ma or more will power this input. **NOTE: The primary (120vac) of the wall transformer should be connected to the utility company side of your service. An UPS is suggested to power the Site Sentinel® 16 during power outages.**

NETWORK connector

Connect one end of the supplied CAT5 (straight or x-over) cable to the desired ETHERNET (WAN/LAN) port.

Silence Sensor Inputs

Connect your unbalanced monaural or stereo audio source to the terminals labeled SS LT, SS GD and SS RT. The level should be between -10 and +24 dbu. The input impedance is approximately 22K ohms. When the SS LT and/or SS RT input has audio applied and the silence sensor function is activated, the front panel SS led will illuminate. If the SS led is out, the signal is too low and if it's flashing, it is in an alarm condition (if enabled).

Power Controller Relay

The jumpers are set to provide the relay common (wiper) on the terminal labeled (JP17, Pwr Cntlr). Please refer to the "Fractional Schematic" and/or "Ciruit Board Assembly Drawing with Jumper Natations" in the appendix for additional jumper options.

Metering (analog) inputs

CAUTION! Metering (analog) input samples may be elevated several hundred volts above ground on some external equipment. Permanent damage may occur to the Site Sentinel® 16 and/or external equipment if a high voltage metering source is connected to the Site Sentinel® 16! Failure to observe this warning may also cause injury to the installer or other personnel. **CAUTION! DO NOT CONNECT SAMPLE VOLTAGES IN EXCESS OF POSITIVE 10 Volts DC OR DAMAGE MAY OCCUR TO YOUR Site Sentinel® 16.**

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Metering (analog) inputs (cont).

CAUTION! Floating Grounds
Except for the status/logic (wet) inputs, none of the Site Sentinel® 16's metering (analog) inputs will accept a floating ground. Damage to the Site Sentinel® 16 or your equipment may result from connecting a floating ground output to the Site Sentinel® 16. If you require metering equipment with inputs that have a floating ground, an DC isolation amplifier should be used.

Sixteen metering (analog) input channels are available with the Site Sentinel® 16 via removable euroblock screw terminals. Connect the positive side of the source to the desired channel terminal labeled MTRxx (where xx is the channel number 01 through 16) and associated MGND (metering ground) terminals.

Each metering (analog) input can handle up to (positive only) 10 volts DC and must be ground referenced and connected to the associated MGND ground terminal. Inputs are self-calibrating and are based on an internal A/D converter with a precision, low-drift voltage reference, so the reading should not drift over time or with temperature. Metering setup is performed by connecting the sample voltage to the MTRxx and MGND metering (analog) input, then calibrated for the desired value (reading).

NOTE: Valid sample voltages MUST be applied to the selected metering input in order to perform calibration.

Status/Logic Inputs

Each optically isolated status/logic inputs can be configured to accept either a contact closure (DRY = default) or a (floating, WET) input. Attach your dry contacts to the desired status/logic channels StxxA and STxxB (where xx is the status/logic input channels 01 thru 16) terminals.

Each input is equipped with a four-position header (please refer to the jumper layout in the appendix). JP1 supports status/logic input one, JP2 status/logic input two, JP3, status/logic input three and JP16, status/logic input sixteen. Each jumper (JPxx, where xx is the status/logic input) and the header pins 1,2,3,4 are used to configure for wet or dry operation. The factory default is DRY. (Switch, relay contact, open collector) with jumpers between 1 & 2 and 3 & 4. In the DRY configuration, the "A" terminal is ground while the "B" terminal is the cathode of the opto-isolator diode (pulled up to 5 volts through a 2.2K resistor).

To change the status/logic input to (floating) WET (user supplied voltage between 5 and 24 vdc), remove both jumpers and place ONE jumper over pins 2 & 3. Connect the positive voltage to terminal "A" (anode) and ground or minus voltage to terminal "B" (cathode). **NOTE: Please refer to the appendix for configuration examples and observe proper polarity.**

Raise and Lower Control Relays

Each of the sixteen raise and lower relays are supplied with SPDT (form C) dry contacts. External equipment to be controlled should be connected to the terminals labeled L1NO, L1CM, L1NC for the sixteen lower relays and R1NO, R1CM, R1NC for the sixteen raise relays.

NOTE: If mechanical latching relays are required, we suggest the Broadcast Tools LR-5 (4PDT & SPST) mechanical latching relay.

TEMPerature Probe Inputs

Insert the temperature probe (one supplied, others optional) (25 foot cable) mini (3.5mm) plug in to any of the rear panel jacks labeled "TEMP" -67°F to +257°F (-55°C TO +125°C). **NOTE: Please limit the total length of cable to 50 feet. Please contact the factory for the proper extension cable. The temperature probe should only be installed or removed with the power supply disconnected from the Site Sentinel® 16.**

12 V DC (Power) connector

Connect the supplied universal 12 volt DC only, 2.5 amp regulated power supply cord in to the Site Sentinel® 16's power jack (center positive) labeled "12V DC Power", then plug the IEC power cord in to a source of 100 to 250 vac 50/60Hz. Verify that the front panel green power led is illuminated. **NOTE: The (RTC) real time clock/calendar's battery may be disabled by removing the jumper over JP20.**

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Web Setup and Operation

Ethernet "Quick Start" guide

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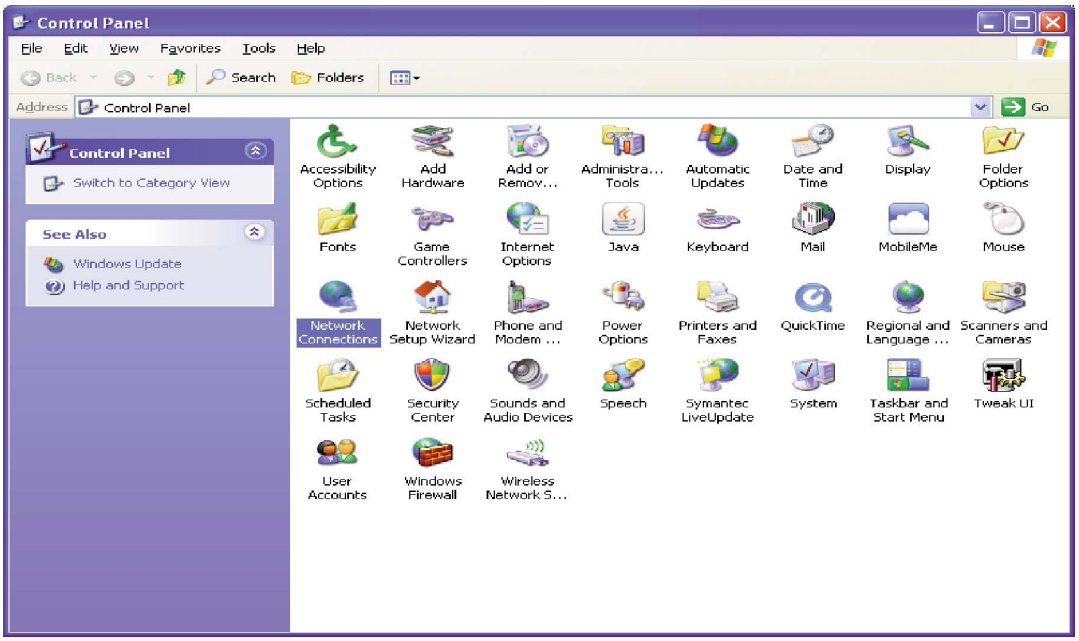
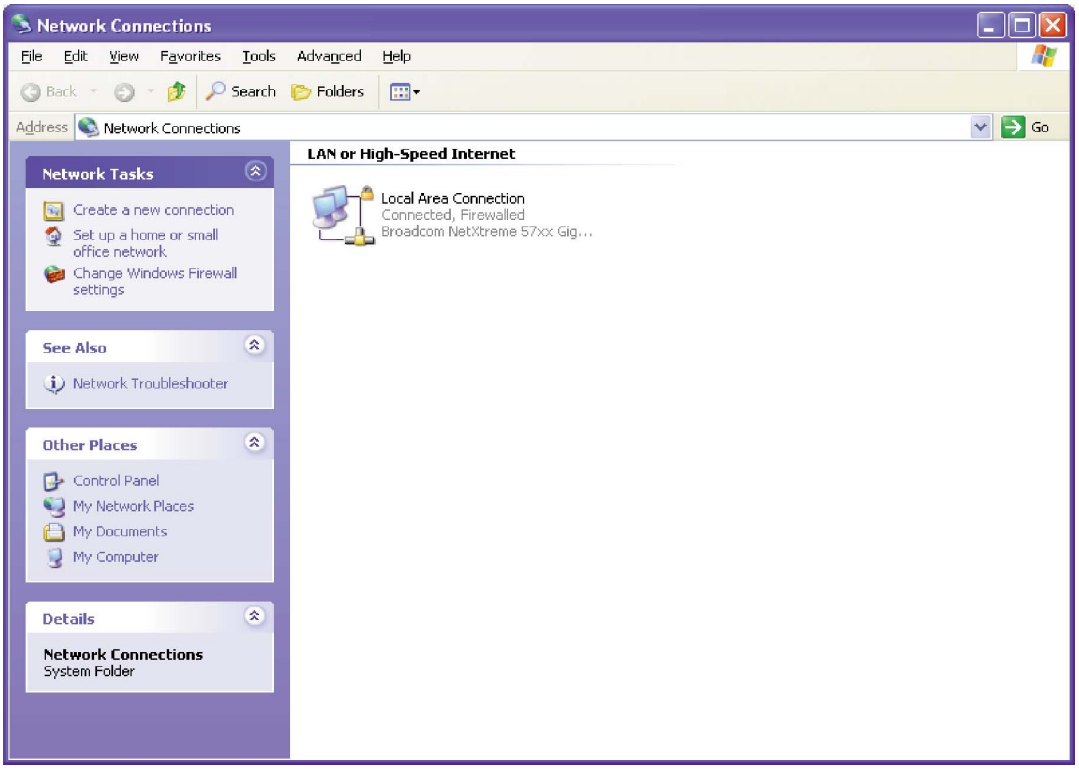
CAUTION! If you are not familiar with Ethernet enabled equipment, it may be useful to contact your IT department, network administrator or network consultant for assistance. Assigning an IP address already in use by another device may cause problems with your network!

Instructions for changing the IP address of the computer that will be used for the configuration of this product are given here. Note that these instructions are specifically for computers with the Windows XP operating system. For setup using other operating systems, refer to the appropriate OS user's manual.

Step 1: Open the control panel by clicking on the start menu, click on settings, then click on Control Panel. (Note that the control panel shown is in "Classic View". If control panel is in "Category View" select the "Classic View" option before proceeding.)



Step 2: Double click on the icon labeled Network Connections. The following menu will pop up.



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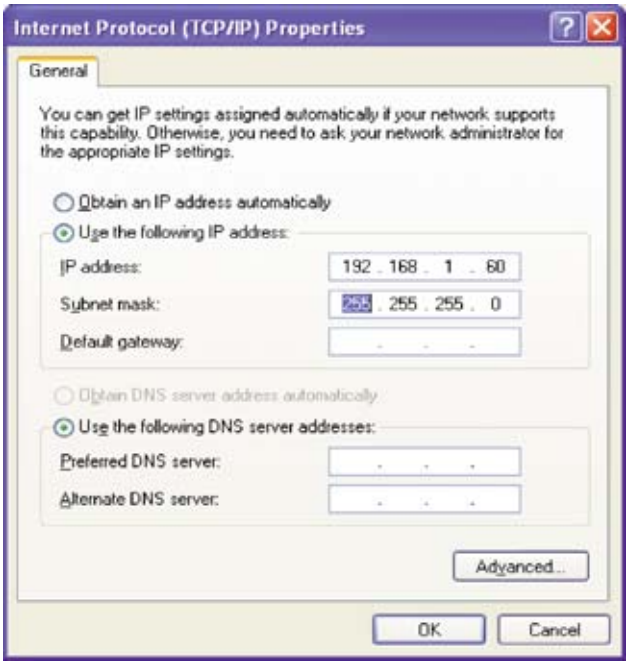
Step 3: Right click on the icon labeled Local Area Connection. Another menu will appear. Select the option at the bottom of the menu labeled Properties. The Local Area Connection Properties window will appear.

Step 4: On the Local Area Connection Properties page, double click on Internet Protocol (TCP/IP) to display properties.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 60
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Step 5: Before making any changes to the network settings, write down the current settings (or screen capture the page and print) so that they can be restored once the unit is configured. Next, select the radio button labeled "Use the following IP address" and type in the IP address 192.168.1.60. Type in the subnet mask of 255.255.255.0. Leave the default gateway field blank. Click OK to apply the new settings.

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Opening the LOGIN Web Page

1. Connect the supplied GRAY colored XOVER cable between the PC's Ethernet port and the products "NET" network RJ45 jack.

2. Connect the supplied 12 volt DC only, 2.5 amp power supply to the product's power jack labeled 12V DC Power. Verify that the front panel green POWER LED is ON and the left "LINK" LED above the "NET" Network RJ-45 connector is illuminated

Ethernet (NETWORK) port LED indicator functions

Link LED Left Side	
Color	Meaning
Off	No Link
Amber	10 Mbps
Green	100 Mbps

Activity LED Right Side	
Color	Meaning
Off	No Activity
Amber	Half Duplex
Green	Full Duplex

3. Open the product's login page by typing the following URL into the browser: http://192.168.1.55 a username and password is required to change any parameter and are case sensitive.

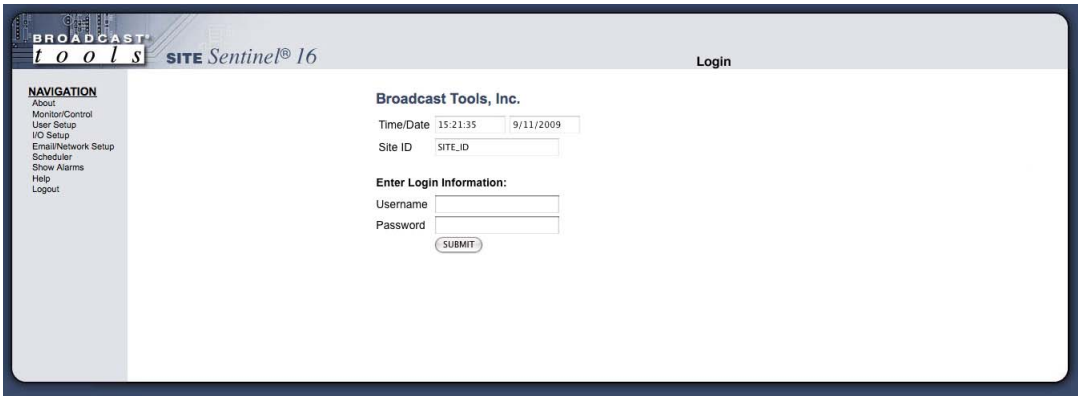
Factory "login" defaults: username: admin (lower case)
password: 1234

4. Once you are logged in, follow this manual for setup and/or operational information.

"Login" Web Page

The Login screen displays the Username and Password entry points.

You may view the password by checking the "Show Password" box



After you have successfully logged in, the Monitor/Control page will be displayed. Depending on your access level, you may or may not be able to control or modify the product's configuration.

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"Monitor/Control" Web Page

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Monitor/Control
NAVIGATION
About
Monitor/Control
User Setup
I/O Setup
Email/Network Setup
Scheduler
Show Alarms
Help
Logout
Date: 6/8/2010
Time: 10:44:50
Site ID: SITE_ID
Queued Logs: Disabled
Chassis Temp: 71.77 *F
Meters
Label Value
Meter 1 0.00 V
Meter 2 0.00 V
Meter 3 0.00 V
Meter 4 0.00 V
Meter 5 0.00 V
Meter 6 0.00 V
Meter 7 0.00 V
Meter 8 0.00 V
Meter 9 7.28 V
Meter 10 7.28 V
Meter 11 7.28 V
Meter 12 7.28 V
Meter 13 0.00 V
Meter 14 0.00 V
Meter 15 0.00 V
Meter 16 0.00 V
Virtual Channels
Label Value
Virtual Channel 1 0.00 V
Virtual Channel 2 0.00 V
Virtual Channel 3 0.00 V
Virtual Channel 4 0.00 V
Relays
Label Action State Label Action State
K 1 Lower lower K 1 Raise raise
K 2 Lower Toggle Pulse K 2 Raise Toggle Pulse
K 3 Lower Toggle Pulse K 3 Raise Toggle Pulse
K 4 Lower Toggle Pulse K 4 Raise Toggle Pulse
K 5 Lower Toggle Pulse K 5 Raise Toggle Pulse
K 6 Lower Toggle Pulse K 6 Raise Toggle Pulse
K 7 Lower Toggle Pulse K 7 Raise Toggle Pulse
K 8 Lower Toggle Pulse K 8 Raise Toggle Pulse
K 9 Lower Toggle Pulse K 9 Raise Toggle Pulse
K 10 Lower Toggle Pulse K 10 Raise Toggle Pulse
K 11 Lower Toggle Pulse K 11 Raise Toggle Pulse
K 12 Lower Toggle Pulse K 12 Raise Toggle Pulse
K 13 Lower Toggle Pulse K 13 Raise Toggle Pulse
K 14 Lower Toggle Pulse K 14 Raise Toggle Pulse
K 15 Lower Toggle Pulse K 15 Raise Toggle Pulse
K 16 Lower Toggle Pulse K 16 Raise Toggle Pulse
Status
Label State
Status 1 OFF
Status 2 OFF
Status 3 OFF
Status 4 OFF
Status 5 OFF
Status 6 OFF
Status 7 OFF
Status 8 OFF
Status 9 OFF
Status 10 OFF
Status 11 OFF
Status 12 OFF
Status 13 OFF
Status 14 OFF
Status 15 OFF
Status 16 OFF
Power Failure
Silence Sensor
Temps
Label Temp ID
Temp Label 1 71 *F 68:E5:5D:1:0:0
NO PROBE 0 *F
NO PROBE 0 *F
NO PROBE 0 *F
Power Controller
Label Action State
Pulse
Power Ctrl. Toggle
Reboot

The Monitor/Control page allows the monitoring and/or control of the Site Sentinel® 16. The following is an explanation of each item on this page:
NOTE: The user defined Site ID, Time, Date, Chassis Temp and Queued Logs are always displayed. Only "admin" level access can edit some of these items.

Queued Logs:	Displays the number of available queued logs, if enabled on the Network Setup Page.
Meters:	Sixteen metering (analog) channels. The labels, values and units are entered in the I/O setup page.
Status:	Displays the condition of the sixteen status/logic inputs.
Relays:	Allows the user with admin or monitor/control access to control each relay for its displayed function.
Power Failure	Illuminated when power is applied, OFF when inadequate DC voltage is applied to the PF jack.
Silence Sensor Level LED's:	Displays the silence sensor input level. The green led operates from -15 and above. The yellow and red led activations are determined by the user programmed trip levels.
Temp	Displays each of 4 temp probes name, temperature and ID.
Power Ctrl	Illuminated when the relay is activated.

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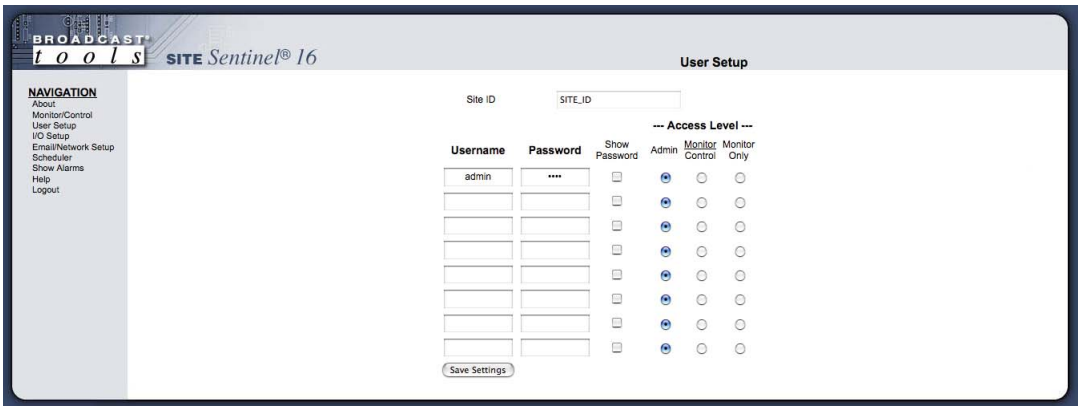
"User Setup" Web Page



This page can only be viewed and configured with an 'admin' access level.

NOTE: You may view the password by checking the "Show Password" box.

Eight Usernames and Passwords may be configured for up to three access levels.

1. "Admin" allows complete product configuration access.

2. "Monitor/Control" allows the following access:
   About, Monitor/Control, Show log (unable to clear log), Help, and Logout.

3. "Monitor Only" allows the following access:
   About, Monitor only, Show log (unable to clear log), Help, and Logout.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

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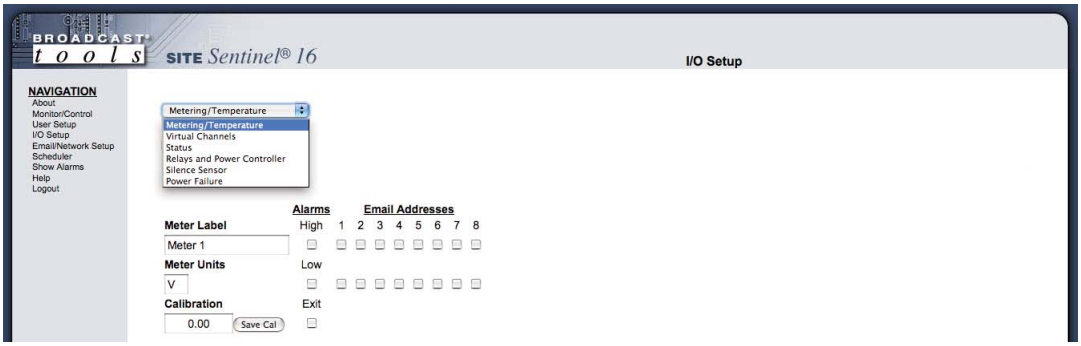
"I/O" Setup Page

The following terms and ideas will help in the configuration of this device.

Alarms: Alarms occur when an I/O Device falls into a specified threshold, this could be an analog value going above or below a set point, a relay turning on or a digital input going high. Each I/O Device can be configured to send Emails when an Alarm occurs.

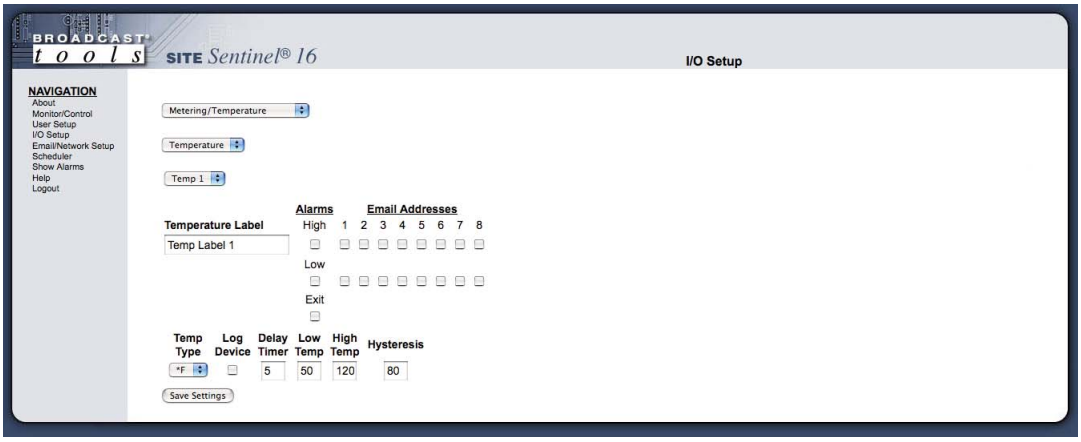
Emails: Each I/O device can be configured to send an email up to 8 email recipients whenever the device enters or exits an alarm condition. Some devices have multiple alarm conditions, such as a High and a Low alarm state. If the device is configured to send an Exit email then the recipients list that was used for entering the alarm state will also be used when exiting the alarm state.

Logs: Each I/O device can be enabled for logging. Logging is configured on the Email/Network Setup page and can be setup to send snapshots of the system at periodic intervals. Only I/O devices enabled for Logging will be included in this snapshot



On the I/O Setup screen, choose from the top drop-down box the device to configure.

Metering/Temperature



On the Metering/Temperature screen, select either Metering or Temperature from the second drop-down box.

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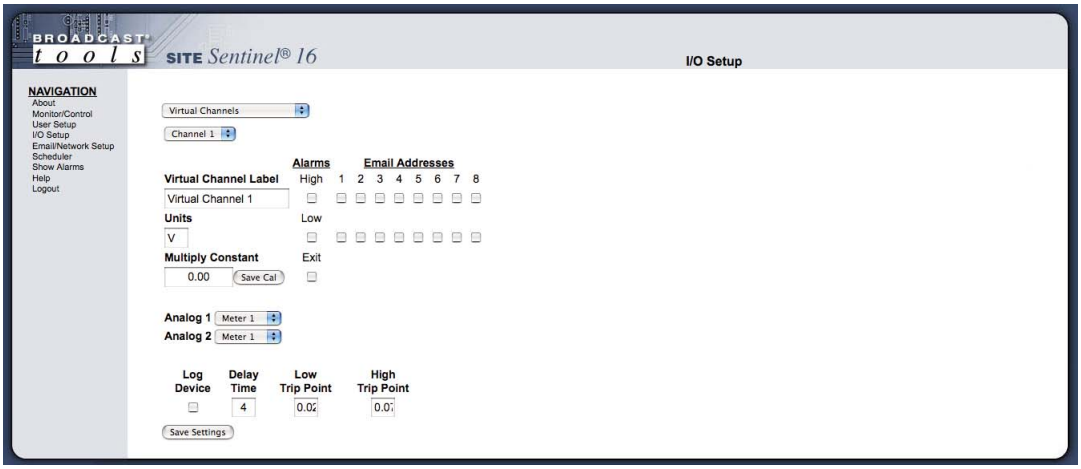
Metering



Metering input selection: Select the metering inputs 1-16 for configuration.

Meter Label: Used to identify the metering input source.

Metering Units: Label in engineering units, such as V = Volts, A = Amps, W = Watts, etc.

Calibration: Enter the value of the desired meter reading.

NOTE: In order to calibrate, a valid DC sample voltage must be applied to each input that you are calibrating. The calibration value must be positive and can support a resolution up to 2 decimal places. The user MUST press the "Save Cal" button in order to store the value. You do not need to press the "Save Settings" button to save the calibration, only other settings.

Alarms High: This option enables the "High Trip Point" email alarm.

Alarms Low: This option enables the "Low Trip Point" email alarm.

Alarms Exit: This option enables the emailing after exiting an alarm.

Email Addresses: This allows you to configure up to 8 emails to be sent whenever the input goes above or below a set-point.

Log Device: This enables the email logging of this device.

Delay time: The delay is in (0 to 999) seconds. This option specifies the wait time from when a value is out of range before an alarm is activated.

Low trip point: This option specifies the LOW alarm set point.

High trip point: This option specifies the HIGH alarm set point.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

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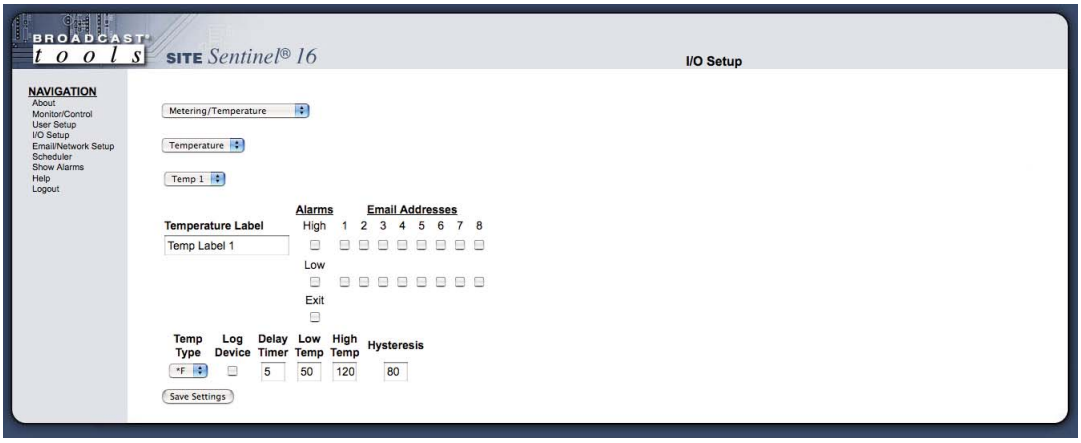
Temperature

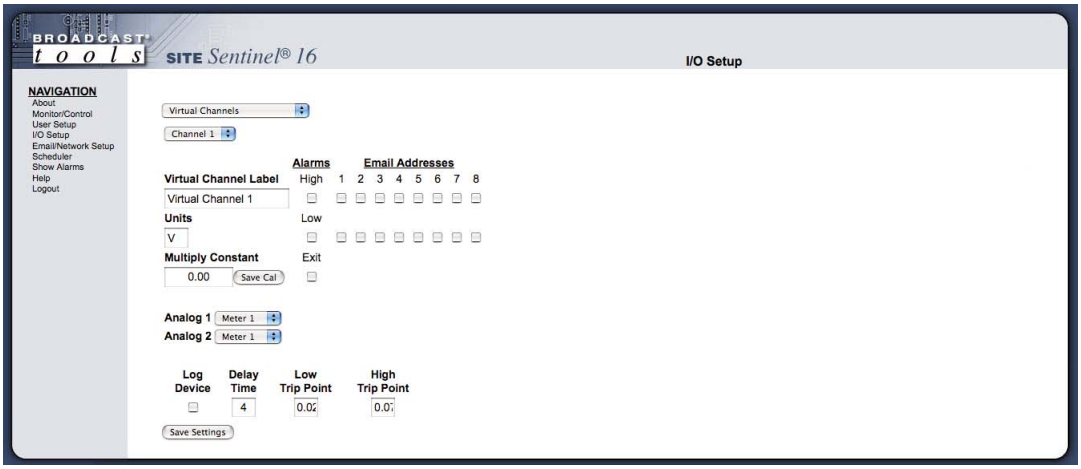


Temperature Label:	Used to identify the temperature probe.
Alarms High:	This option enables the “High Trip Point” email alarm.
Alarms Low:	This option enables the “Low Trip Point” email alarm.
Alarms Exit:	This option enables the emailing after exiting an alarm.
Email Addresses:	This allows you to configure up to 8 emails to be sent whenever the input goes above or below a set-point.
Log Device:	This enables the email logging of this device.
Delay time:	The delay is in (0 to 999) seconds. This option specifies the wait time from when a value is out of range before an alarm is activated.
Low Temp:	This option specifies the LOW alarm set point.
High Temp:	This option specifies the HIGH alarm set point.
Temp Type:	This option specifies what scale will be displayed, Fahrenheit or Centigrade.
Hysteresis:	Hysteresis (deadband), This option specifies the hysteresis used when evaluating alarm conditions.

NOTE: Hysteresis prevents alarms from toggling excessively when temperature is at the set point. This is due to normal fluctuation. For example, if the hysteresis is set to 1 degree, and a high alarm is to occur at 91 degrees, the hysteresis ensures that once the high alarm is triggered, it won't go off until the temperature returns to below 91 degrees (90 - 1). This reduces problems with small fluctuations in temperature readings triggering multiple alarms. The hysteresis is also used during low alarm conditions. If, for example, a low alarm is to occur at 43 degrees and the hysteresis is set to 1 degree, then once the low alarm is triggered, it won't go off until the temperature returns to higher than 44 degrees (43 + 1).

NOTE: After any item has been changed, you MUST press the “Save Settings” button for your changes to be saved.

Virtual Channels



Virtual Channel selection: Select the virtual channel 1-16 for configuration.

Virtual Channel Label: Used to identify the virtual channel source.

Virtual Channel Units: Label in engineering units, such as V = Volts, A = Amps, W = Watts, etc.

Multiply Constant: Enter the value of the multiplier constant.

Analog 1 and 2: Number of Meter to use in Virtual Channel calculation.

NOTE: The value of the Virtual Channel will be calculated by multiplying Analog 1, Analog 2 and the Multiply Constant together.

Alarms High: This option enables the "High Trip Point" email alarm.

Alarms Low: This option enables the "Low Trip Point" email alarm.

Alarms Exit: This option enables the emailing after exiting an alarm.

Email Addresses: This allows you to configure up to 8 emails to be sent whenever the input goes above or below a set-point.

Log Device: This enables the email logging of this device.

Delay time: The delay is in (0 to 999) seconds. This option specifies the wait time from when a value is out of range before an alarm is activated.

Low trip point: This option specifies the LOW alarm set point.

High trip point: This option specifies the HIGH alarm set point.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

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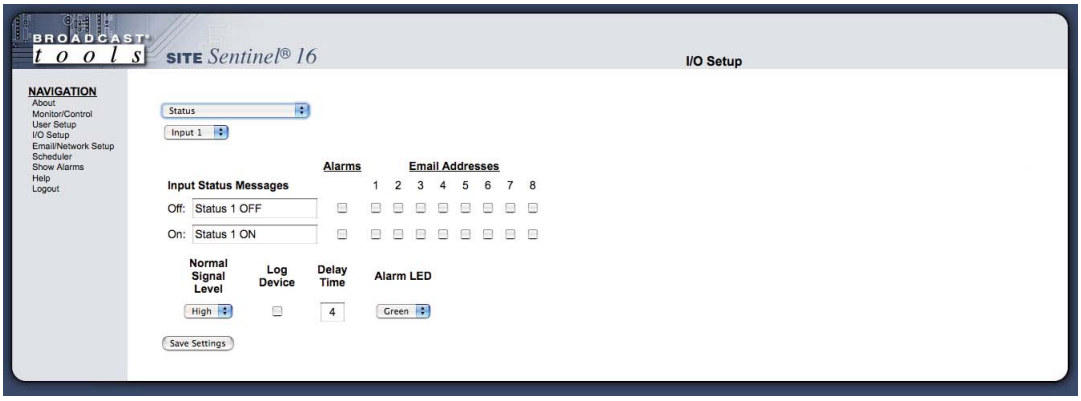
Status



Input Status Messages: Used to identify the status input source.

Alarms OFF: This option enables the sending of an email when the input is OFF.

Alarms ON: This option enables the sending of an email when the input is ON.

Email Addresses: This allows you to configure up to 8 emails to be sent whenever the input is turned ON or OFF.

Normal Signal Level: This drop-down configures the input signal to be normally High or normally Low. This is used to determine if an input is ON or OFF.

NOTE: When the "Normal signal level" is set to HIGH = NO voltage is applied to the input (WET or no closure when configured for DRY), it's considered OFF, when voltage IS applied (WET or completed closure set to DRY) to the input, it considered ON.

Log Device: This enables the email logging of this device.

Delay time: The delay is in (0 to 999) seconds. This option specifies the wait time from when a value is out of range before an alarm is activated.

Alarm LED: User defined color of LED on the Monitor and Control page when in an alarm condition.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

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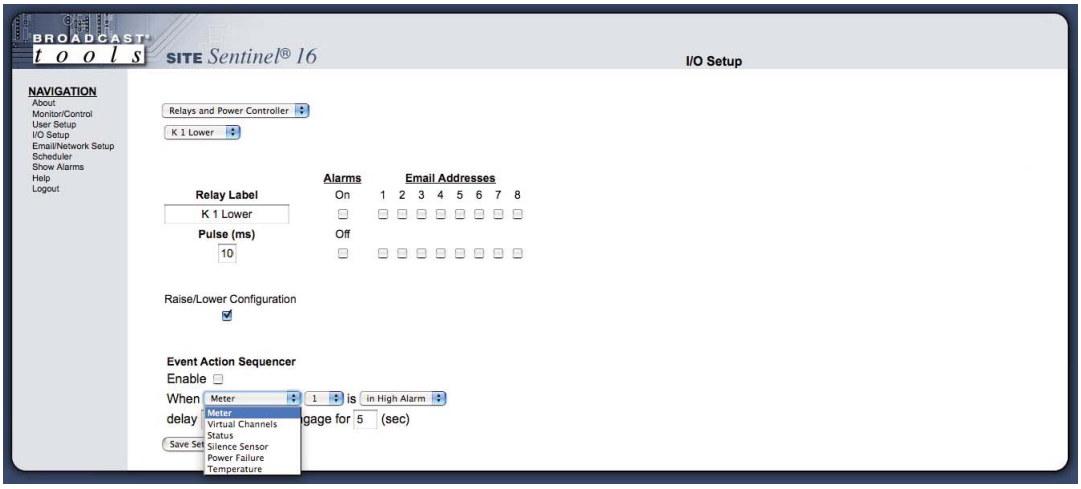
Relays



Relay label: Used to identify the device.

Alarms OFF: This option enables the sending of an email when the relay is OFF.

Alarms ON: This option enables the sending of an email when the relay is ON.

Email Addresses: This allows you to configure up to 8 emails to be sent whenever the relay is turned ON or OFF.

Pulse: This is the number of milliseconds the relay will be toggled when the pulse is activated.

NOTE: Pulse will toggle the relay, delay for the specified amount of time and then toggle the relay again. If the relay is already on, Pulse will turn it off, delay then turn it on.

Relays – Event Action Sequencer

Event action sequencer: Used to perform a relay function when other I/O devices are within/outside the configured range.

Enable: Enables the selected input to monitor for each relay.

Action: When (meter, status, silence sensor, power failure or temperature) (input number) is (in ? condition) delay (xx) seconds then engage for (xx) seconds.

Event action sequencer EXAMPLE: When (meter) (1) is (in High Alarm) delay (1) seconds then engage for (2) seconds.

In the above example: When [metering input] [1] is [in high alarm] for more than [1] second, (the desired relay) then engage for [pulse] 2 seconds.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

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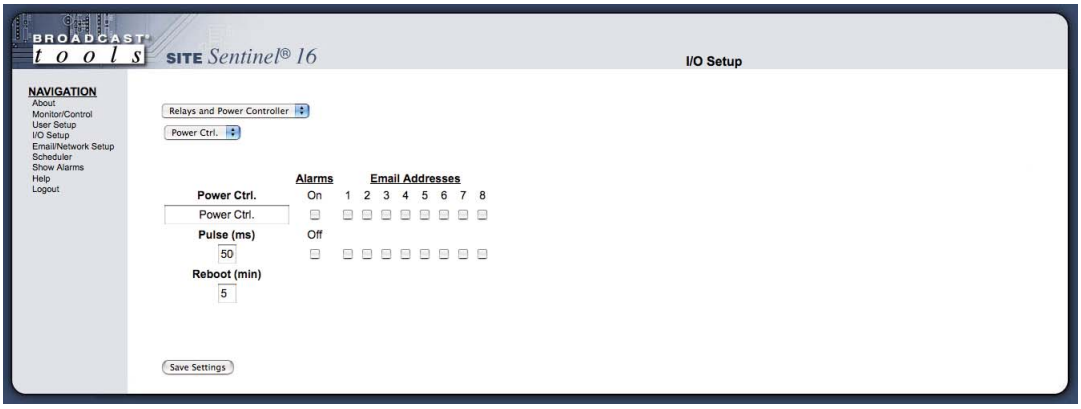
Power Controller



Power Ctrl label: Used to identify the device.

Alarms OFF: This option enables the sending of an email when the relay is OFF.

Alarms ON: This option enables the sending of an email when the relay is ON.

Email Addresses: This allows you to configure up to 8 emails to be sent whenever the relay is turned ON or OFF.

Pulse: This is the number of milliseconds the relay will be toggled when the pulse is activated.

Reboot: Reboot is identical to Pulse except that it uses minutes instead of milliseconds.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

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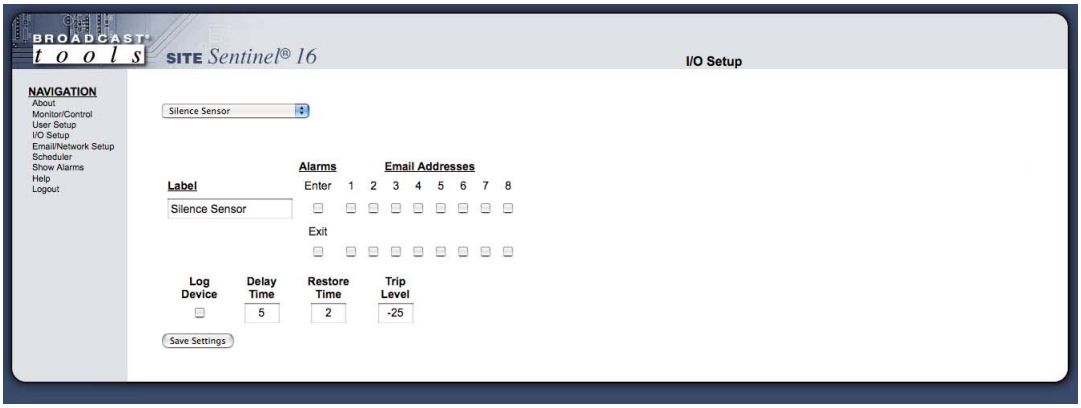
Silence Sensor



Label: Used to identify the monitoring source.

Alarms Enter: This option enables the email alarms if the input source is measured less than the Trip Level.

Alarms Exit: This option enables the email alarms when the input source is measured as greater than or equal to the Trip Level

Email Addresses: This allows you to configure up to 8 emails to be sent whenever the input enters or exits an alarm.

Log Device: This enables the email logging of this device.

Delay Time: The delay is in (0 to 999) seconds. This option specifies the wait time from when a value is out of range before an alarm is activated.

Restore Time: The restore delay in (0 to 999) seconds. The input source must be good for this amount of time before the alarm is cleared.

Trip Level: Value from -25db to -35db below reference in 1db steps when input source is considered to be in an alarm condition.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

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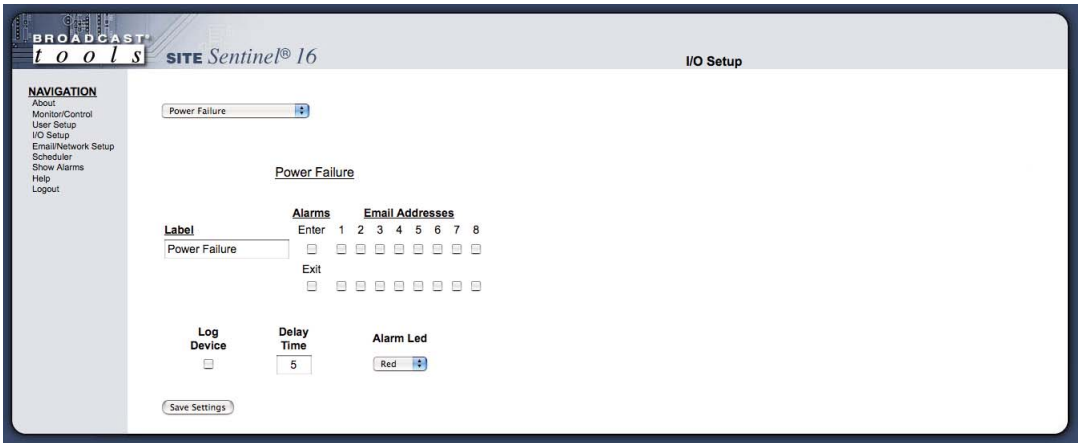
Power Failure



Label: Used to identify the monitoring source.

Alarms Enter: This option enables the email alarms if the voltage is no longer present on this input.

Alarms Exit: This option enables the email alarms when the voltage returns.

Email Addresses: This allows you to configure up to 8 emails to be sent whenever the input enters or exits an alarm.

Log Device: This enables the email logging of this device.

Delay Time: The delay is in (0 to 999) seconds. This option specifies the wait time from when a value is out of range before an alarm is activated.

Alarm LED: User defined color of LED on the Monitor and Control page when in an alarm condition.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

Restoring Network Factory Defaults

NOTE: The Site Sentinel® 16 factory defaults may be restored by holding the "Default" button IN, repowering the unit, wait for the SS and PF LED's to flash, then release the "Default" button.

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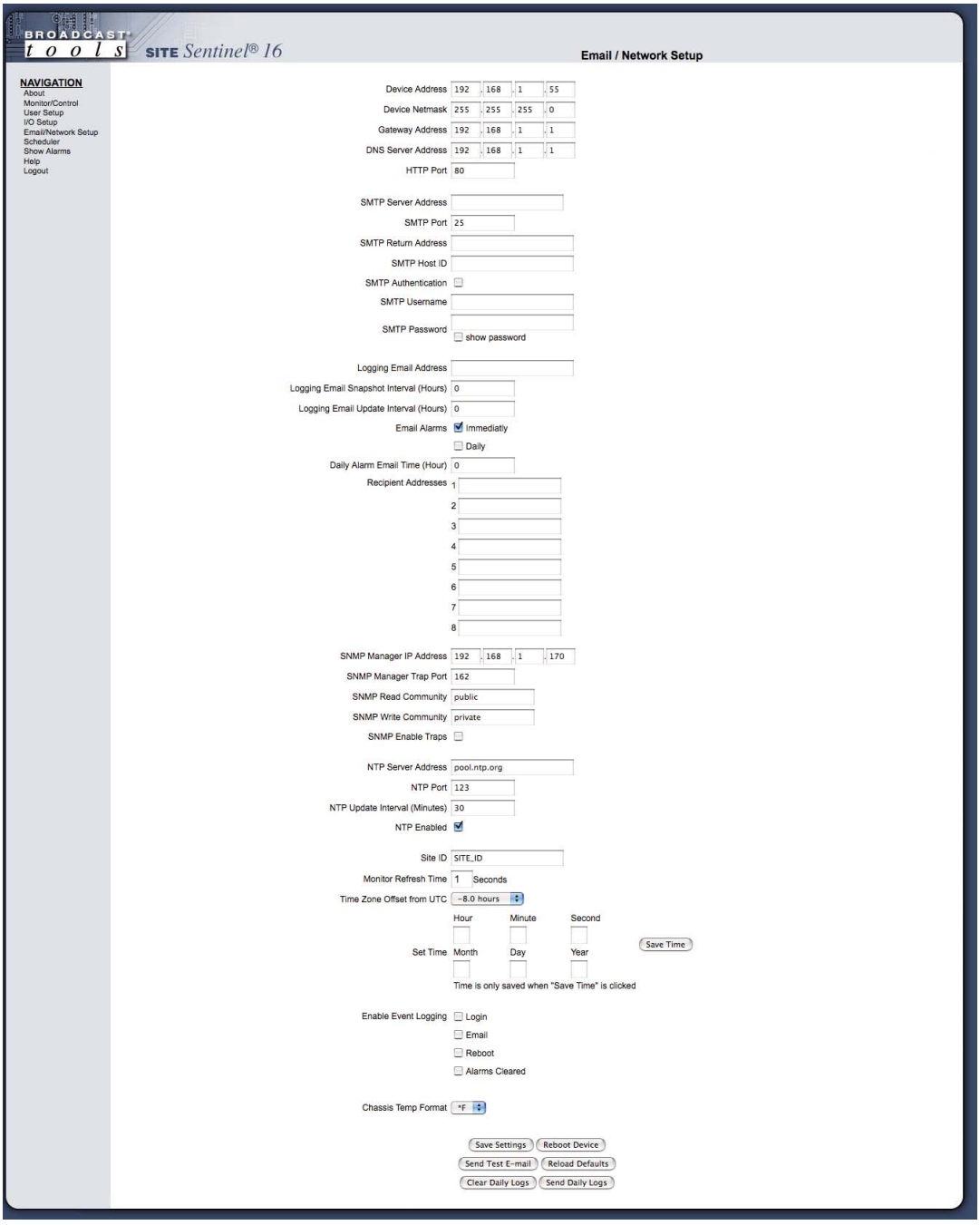
"Email/Network Setup" Web Page



"Email/Network Setup" Web Page – Device Network Settings

Device Address:	Enter a static IP address here.	Default: 192.168.1.55
Device Netmask:	Enter the Netmask here:	Default: 255.255.255.0
Gateway Address:	Enter the Gateway IP here:	Default: 192.168.1.1
DNS Server IP Address:	Enter your DNS address here.	Default: 192.168.1.1
HTTP Port:	Normally Port 80	Default: 80

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"Email/Network Setup" Web Page – SMTP Settings

SMTP Server Address:	The user can enter either an IP address in the xxx.xxx.xxx.xxx format or a URI in the form: smtp.comcast.net. In order to resolve the URI, a working DNS server must be present or its IP address entered into the system.	
SMTP Port:	Normally Port 25	Default: 25
SMTP Return Address:	Enter your return email here. If an email cannot be delivered, a message stating why will be sent to this address.	

NOTE: The user must enter the following items before an email can be successfully sent: SMTP Server Address, SMTP Port, SMTP Return Address, SMTP Host ID, SMTP username and SMTP password must be supplied if authentication is turned on and the Recipient Address 1. The test email is sent to email recipient address 1.

The user should press the "Save Settings" button after entering the SMTP information before attempting an email test. If authentication fails, the email is not sent, please ensure that the username and password is correct.

SMTP Host ID:	Enter something here to identify the device.
SMTP Authentication:	When checked, Base64 SMTP authentication is supported by clicking on the checkbox.
SMTP Username:	Enter user name here.
SMTP Password:	Enter password here.

"Email/Network Setup" Web Page – Email Logging Settings

Logging Email Address:	IP address for the "Logging" email recipient (may be different from the 8 "Alarm" Recipient Addresses. Logging emails and Daily emails are sent to this address.
Logging Email Snapshot Interval:	The period in hours that a snapshot is taken of the system. An email is not sent on this interval.
Logging Email Update Interval:	The period in hours that the snapshots are emailed. This email may contain multiple snapshots if the Snapshot Interval is less than the Update Interval. Each snapshot will be identified by the date and time.

"Email/Network Setup" Web Page – Email Alarm Settings

Email Alarms: Choose Immediate and/or Daily. If Immediate is selected, then an email will be sent out as soon as an alarm is generated. If Daily is selected, then each alarm is queued and the number of queued alarms is displayed on the Monitor/Control page.

Daily Alarm Email Time: The time that queued alarms are sent. Queued alarms are sent to the Logging Email Address only.

"Alarm" Recipient Address: Email addresses for up to 8 addresses. These address correlate to the 8 email addresses selectable on each I/O Device.

"Email/Network Setup" Web Page – SNMP Manager Settings

SNMP Manager IP Address: This is the IP address of the SNMP manager. The system only accepts SNMP requests from this IP address, and will send traps to this IP address only.

SNMP Manager Trap Port: This is the port number that SNMP trap messages will be sent.

SNMP Read Community: This is the community name for Read-Only access.

SNMP Write Community: This is the community name for Read-Write access.

SNMP Enable Traps: When checked, trap messages will be sent. When Unchecked, no trap messages will be sent.

NOTE: A cold-start trap will be sent when the unit boots up if the SNMP Enable Traps is checked, otherwise trap messages are sent when a device enters or exits an alarm condition, depending on whether or not alarms are enabled.

"Email/Network Setup" Web Page – NTP Settings

NTP (Time) Server Address:	Enter the NTP address here.	Default: pool.ntp.org
NTP Port:	Normally 123.	Default: 123
NTP Update Interval (Min):	Time between timing updates.	Default: 30
NTP Enabled:	Must be enabled for correct timing.	Default: Enabled

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"Email/Network Setup" Web Page – Other Settings

Site ID:	This is the Site Identifier that will be sent in each email.
Monitor Refresh Time (Sec):	How many seconds the Monitor page refreshes. Shorter times may increase network traffic.
Time Zone Offset from UTC:	Must be set for correct timing. Default: -8
Set Time:	The hour, minute, second, month, day and year boxes can be used to set the time of the RTC. The time is only updated if you click "Save Time" and not when you "Save Settings".
Enable Event Logging:	Enabling these checkboxes will generate an alarm, but will not send an email. If the system is configured for Daily Alarm emails, then that Daily Alarm email will contain the Event Logging items as well.
Login:	Whenever someone logs into the system, the username and date/time will be logged.
Email:	Whenever an email is sent, the type of email and date/time will be logged.
Reboot:	Whenever the device boots, the date/time will be logged.
Alarms Cleared:	Whenever the Daily Logs or Normal Alarms are cleared, the type of log cleared and date/time will be stored. When Daily Logs are sent, the Daily Logs are also cleared; this will cause an event log as well.

"Email/Network Setup" Web Page – Controls

Save Settings: After pressing the "Save Settings" button, the device will reboot (If you changed the IP address, you must navigate your web browser to the new IP address (if the HTTP port was changed from port 80, be sure to add the new port number after the IP: xxx.xxx.xxx.xxx:port #). If you didn't change the IP address, then the web page will return to the login screen after the device reboots.

Reboot Device: When you press the "Reboot Device" button, the device resets, you must navigate your web browser to the new IP address.

Send Test Email: Press this button to send a test email. When the email has Completed, an alert box will pop-up indicating the status of the email and an error condition if the email was not sent correctly. If an email was not sent correctly, please review your SMTP settings and correct as necessary.

NOTE: After you are done making changes to the Email/Network Setup page, you MUST press the "Save Settings" button to save your changes.

Reload Defaults: When you press the "Reload Defaults" button, the device resets, you must navigate your web browser to the new IP address (if the HTTP port was changed from port 80, be sure to add the new port number after the IP: xxx.xxx.xxx.xxx:port #).

Clear Daily Logs: When you press the "Clear Daily Logs" button, the daily logs stored in memory will be cleared. Keep in mind that if the Alarms Cleared Event is enabled, this event will post after the logs are cleared.

Send Daily Logs: When you press the "Send Daily Logs" button, the system will send the daily logs email and then clear those logs as if the correct time has expired.

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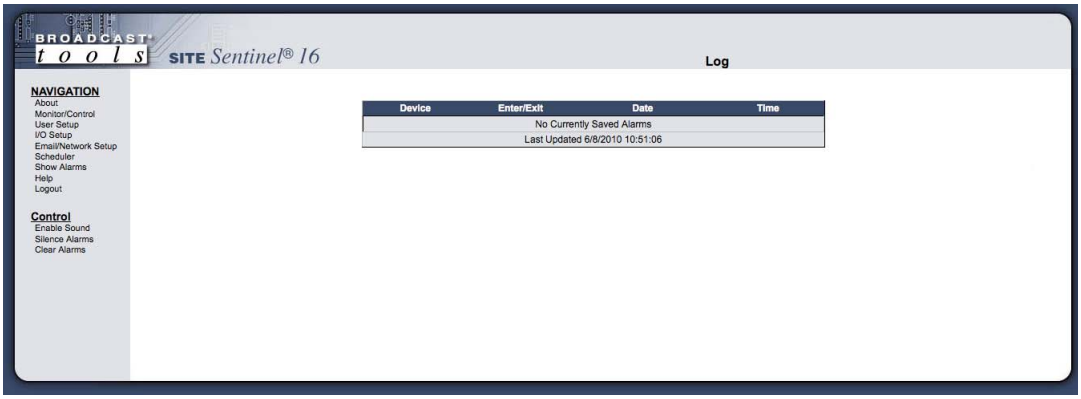
"Show Log" Web Page

This page displays current alarms.



Device : Displays which device and/or devices triggered the alarm.

Enter/Exit: Displays if the alarm is entering or exiting an alarm condition.

Date: Displays what date the alarm was logged.

Time: Displays what time the alarm was logged.

NOTE: With the "admin" access level, the user may control all functions.

With the "Monitor/Control" or "Monitor" only access level, the user may view the "Show Log", enable/disable PC speaker sound and silence alarms.

NOTE: Shock Wave "Flash" must be installed and operating properly on your PC for the "Alarm Sound" to work when enabled.

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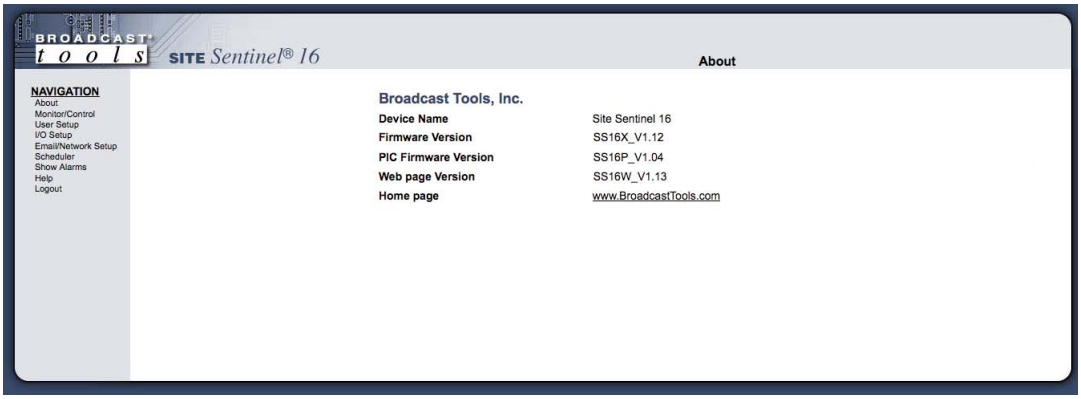
"About" Web Page



The "About" Web Page displays the product name, firmware version numbers, and Broadcast Tools® Web site link.

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SPECIFICATIONS

Ethernet Interface:	RJ-45, 10Base-T or 100Base-TX, auto sensing with Link & activity indicator - Full/half duplex.
Control Logic:	Micro with non-volatile memory and web server.
Temperature Sensor inputs (4):	Probe (1 supplied) with 25-foot cable and 1/8" T/R/S plug. -67°F to +257°F (-55°C TO +125°C).
Silence Sensor:	Stereo unbalanced 22K ohm inputs. Input level: -10dBu to +24dBu. Note: Summed to monaural.
Control Relays:	32 SPDT (form C) dry contacts, 30 VDC @1 amp.
Power Controller Relay: CAUTION!	SPDT dry contacts. 30 VDC @ 1 amp. For safety, never connect 120 Vac circuits to the above relays!
Metering (analog) inputs:	Sixteen - Single ended (ground referenced) 0 to 10 VDC input range. 100K ohm input Z. 12-bit resolution.
Status/Logic inputs:	Sixteen - Optically Isolated. Internal jumpers for (WET), floating) external 5 to 24 VDC or internal 5 VDC source (DRY). Open collector, contact closures to ground or external logic source.
Power Failure input:	Optically-isolated, 5 to 12 VDC @ 15 ma, center positive. 2.1mm x 5.5mm coax type.
Connectors:	Metering (analog), status, relays and silence sensor audio input: Removable euroblock screw terminals, 2 x 2.1mm x 5.5mm coax type power jacks and four - 1/8" T/R/S mini-jack temp probe.
EMI / FCC Compliance:	See the Declaration of Conformity page. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) this device must accept any interference received, including that which may cause undesired operation.
Protocols:	TCP/IP, UDP/IP, ARP, ICMP, SNMP, TFTP, Telnet, DHCP, BOOTP, HTTP, and AutoIP.
Required power supply (supplied):	12 Volt DC only @ 2.5 amp. 2.1mm ID x 5.5mm OD coaxial connector, center positive. Surge protected. Universal (100 - 240 vac / 50/60 Hz) with IEC input plug with domestic AC cord.
Size:	19.00" x 6.00" x 1.75", aluminum chassis and steel front panel.
Weight:	5.0 lb.
Options:	* LR-5, 5-pole mechanical latching relay. * Temperature probe.

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LIMITED WARRANTY

The term "Buyer" as used in this document refers to and includes both (but only) (a) any person or entity who acquires such an item for the purpose of resale to others (i.e., a dealer or distributor of an item), and (b) the first person or entity who acquires such an item for such person's or entity's own use.

Broadcast Tools warrants to each Buyer of any item manufactured by Broadcast Tools that the item will be free from defects in materials and workmanship at the time it is shipped by Broadcast Tools if the item is properly installed, used and maintained.

EXCLUSIVE REMEDIES

If Broadcast Tools is notified, in writing, of a failure of any item manufactured by Broadcast Tools to conform to the foregoing Limited Warranty within one (1) year following the date of the Buyer's acquisition of the item, and if the item is returned to Broadcast Tools in accordance with Broadcast Tools' instructions for confirmation by inspection of the defect (which at Broadcast Tools' election may include, without limitation, a requirement that the Buyer first obtain a Return Authorization number from Broadcast Tools, that the Buyer furnish proof of purchase in the form of an invoice and/or receipt, and that the Buyer prepay all freight charges associated with any return of the item to Broadcast Tools using such freight service as Broadcast Tools reasonably may specify), Broadcast Tools will repair or replace the defective item, or will refund the purchase price paid by the Buyer for the item. Broadcast Tools shall have the exclusive right to choose between these alternative remedies.

NO OTHER WARRANTIES OR REMEDIES

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Broadcast Tools, Inc.
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360.854.9559 **voice** • 866.783.1742 **fax**
support@broadcasttools.com **e-mail**
www.broadcasttools.com **website**

Declaration of Conformity

The XPORT Device contained in the Site Sentinel® 16 conforms to the following standards: (according to ISO/IEC Guide 22 and EN 45014)

Manufacturer's Name & Address:
Site Sentinel® 16:
Broadcast Tools, Inc.
131 State Street.
Sedro Woolley, WA 98284-1503 USA

XPORT:
Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA
Declares that the following product:

Product Name Model: XPORT™ Device Server
Conforms to the following standards or other normative documents:

Electromagnetic Emissions:
EN55022: 1998 (IEC/CSPIR22: 1993) Radiated RF emissions, 30MHz-1000MHz
Conducted RF Emissions – Telecom Lines – 150KHz - 30MHz
FCC Part 15, Subpart B, Class B
IEC 1000-3-2/A14: 2000
IEC 1000-3-3: 1994

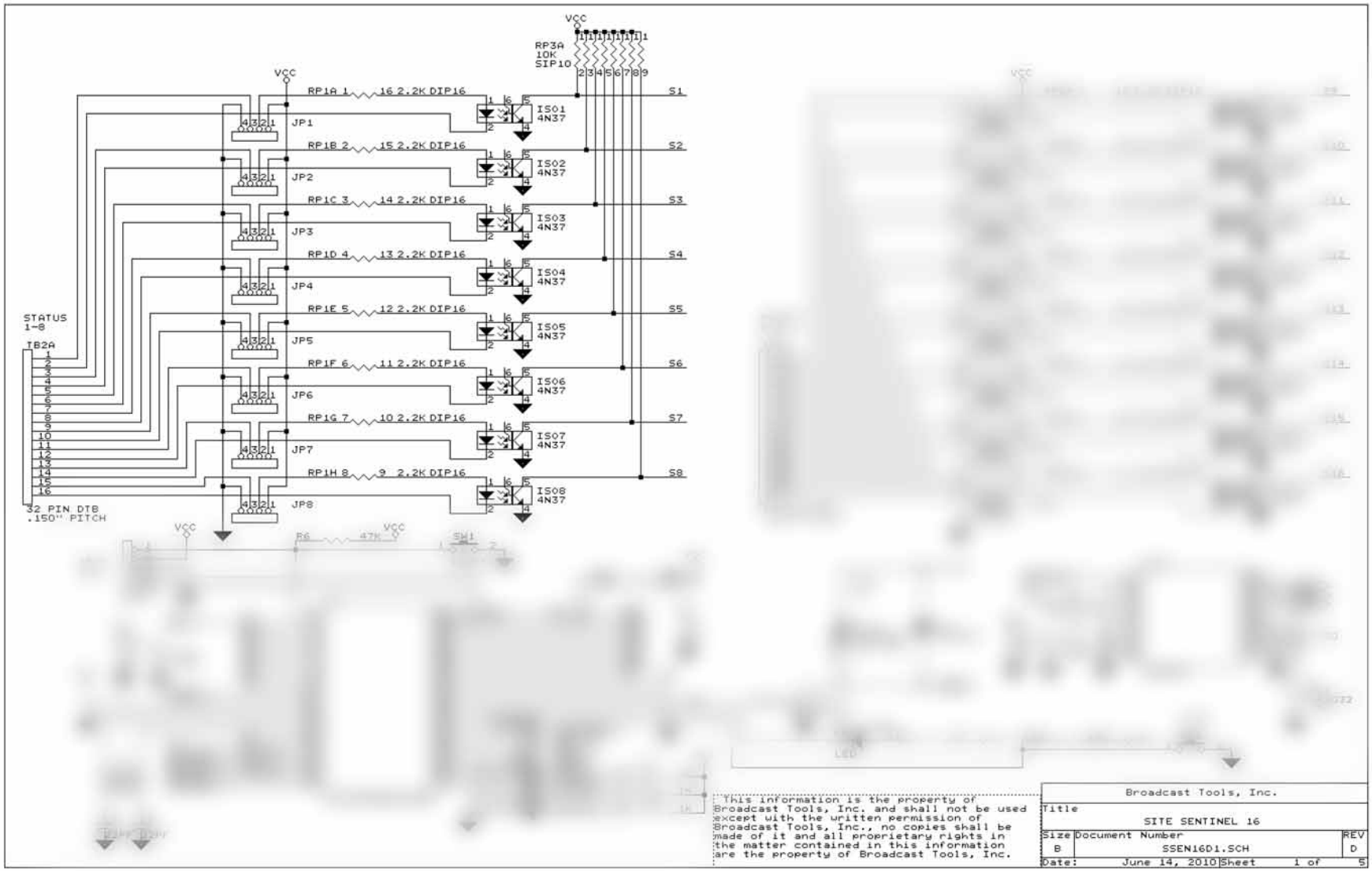
Electromagnetic Immunity:
EN55024: 1998 Information Technology Equipment-Immunity Characteristics
Direct ESD, Contact Discharge
Indirect ESD
Radiated RF Electromagnetic Field Test
Electrical Fast Transient/Burst Immunity
RF Common Mode Conducted Susceptibility
Power Frequency Magnetic Field Test

Manufacturer's Contact:
Site Sentinel® 16
Broadcast Tools, Inc.
131 State Street
Sedro Woolley, WA 98284-1503 USA
Tel: 360.854.0608 Fax: 866.783.1742

XPORT
Lantronix:
Director of Quality Assurance
15353 Barranca Parkway, Irvine, CA 92618 USA
Tel: 949.453.3990 Fax: 949.453.3995

WEBSITE:
Visit our web site for product updates and additional information.

Fractional Schematic



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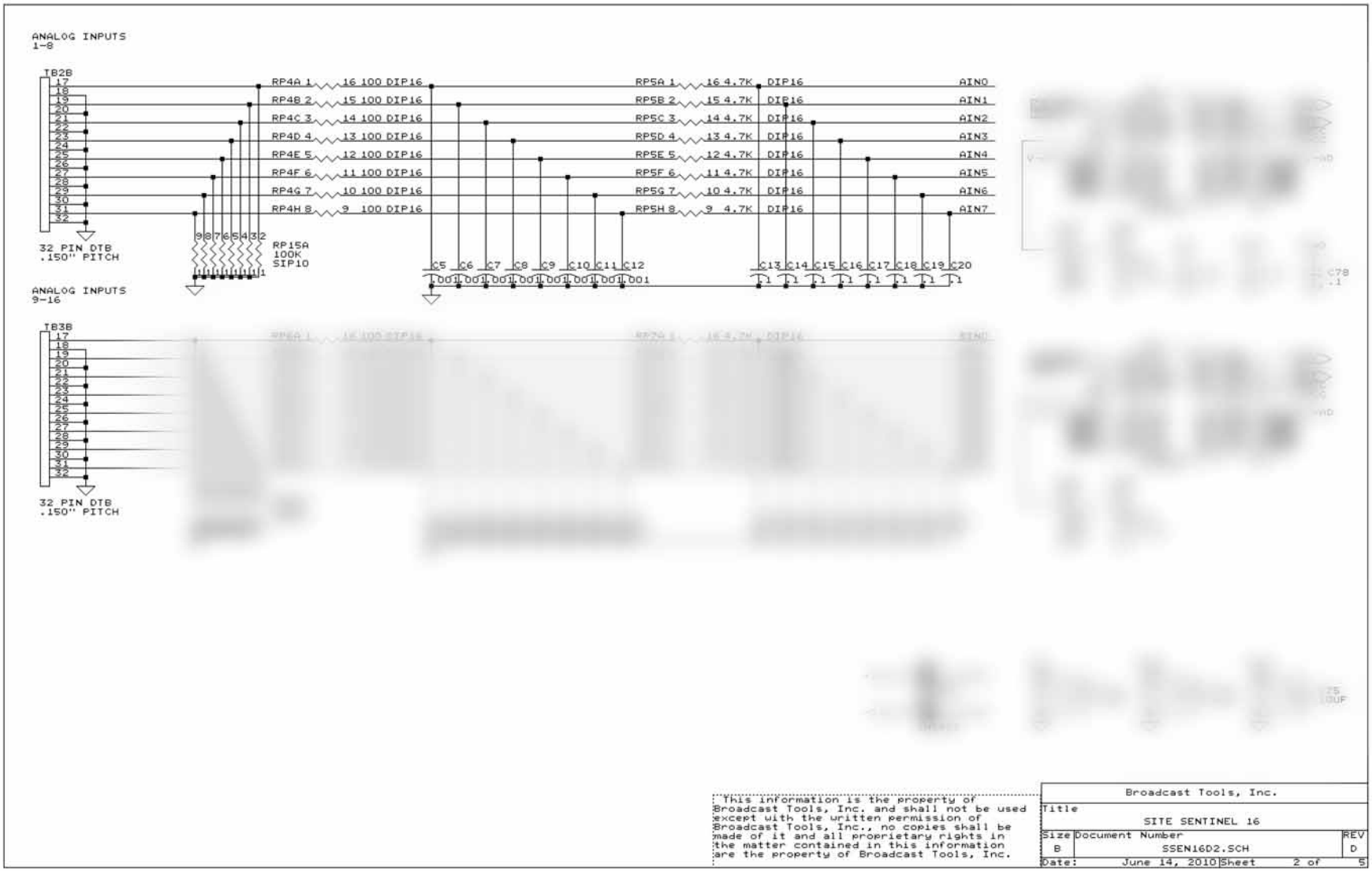
Fractional Schematic


ANALOG INPUTS
1-8
TB2B
32 PIN DTB
.150" PITCH
RP4A 1 16 100 DIP16
RP4B 2 15 100 DIP16
RP4C 3 14 100 DIP16
RP4D 4 13 100 DIP16
RP4E 5 12 100 DIP16
RP4F 6 11 100 DIP16
RP4G 7 10 100 DIP16
RP4H 8 9 100 DIP16
RP15A
100K
SIP10
RP5A 1 16 4.7K DIP16
RP5B 2 15 4.7K DIP16
RP5C 3 14 4.7K DIP16
RP5D 4 13 4.7K DIP16
RP5E 5 12 4.7K DIP16
RP5F 6 11 4.7K DIP16
RP5G 7 10 4.7K DIP16
RP5H 8 9 4.7K DIP16
AIN0
AIN1
AIN2
AIN3
AIN4
AIN5
AIN6
AIN7
C5 C6 C7 C8 C9 C10 C11 C12
C13 C14 C15 C16 C17 C18 C19 C20
ANALOG INPUTS
9-16
TB3B
32 PIN DTB
.150" PITCH
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Title
SITE SENTINEL 16
Size B
Document Number SSEN16D2.SCH
REV D
Date: June 14, 2010 Sheet 2 of 5

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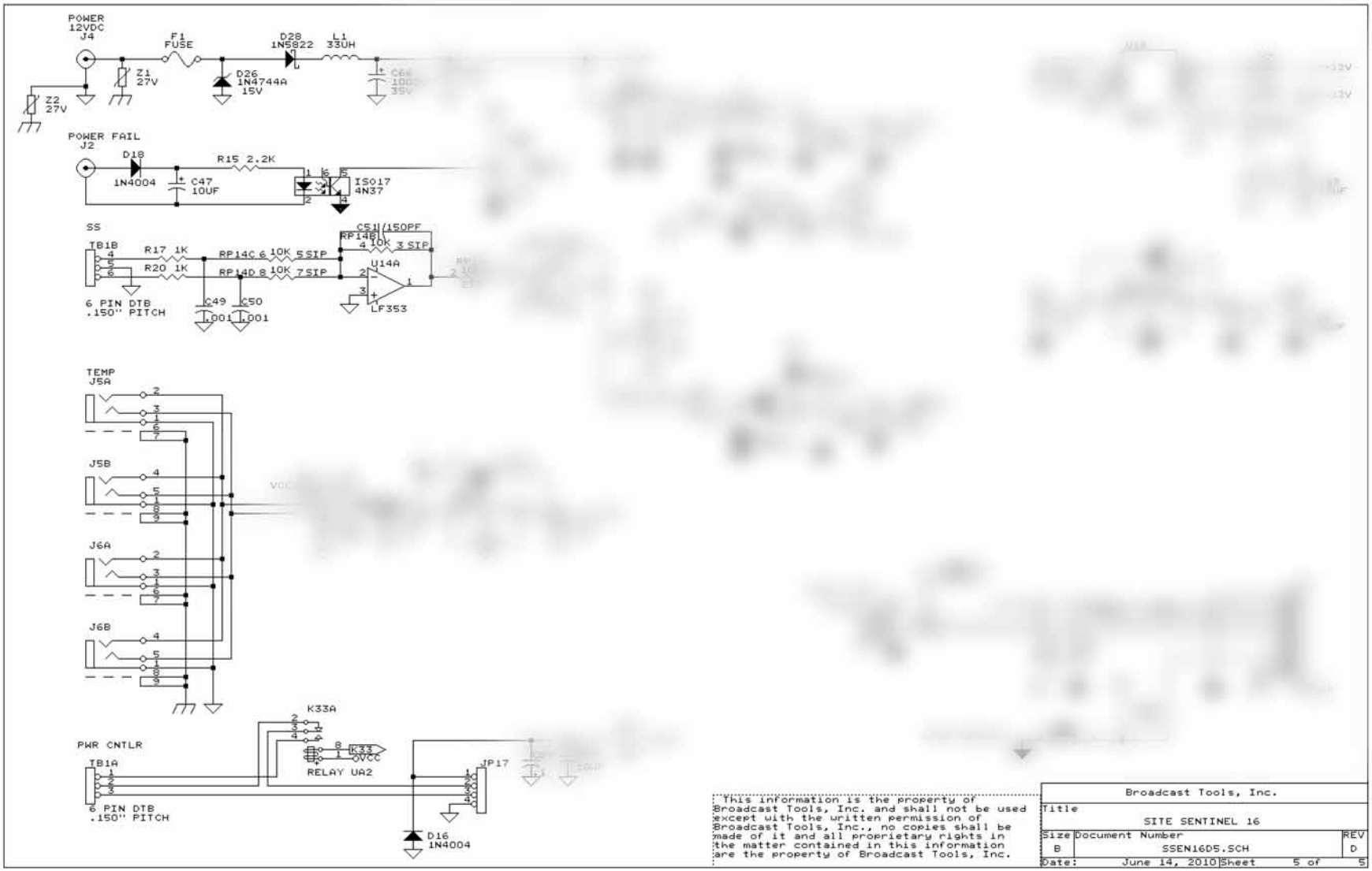
Fractional Schematic



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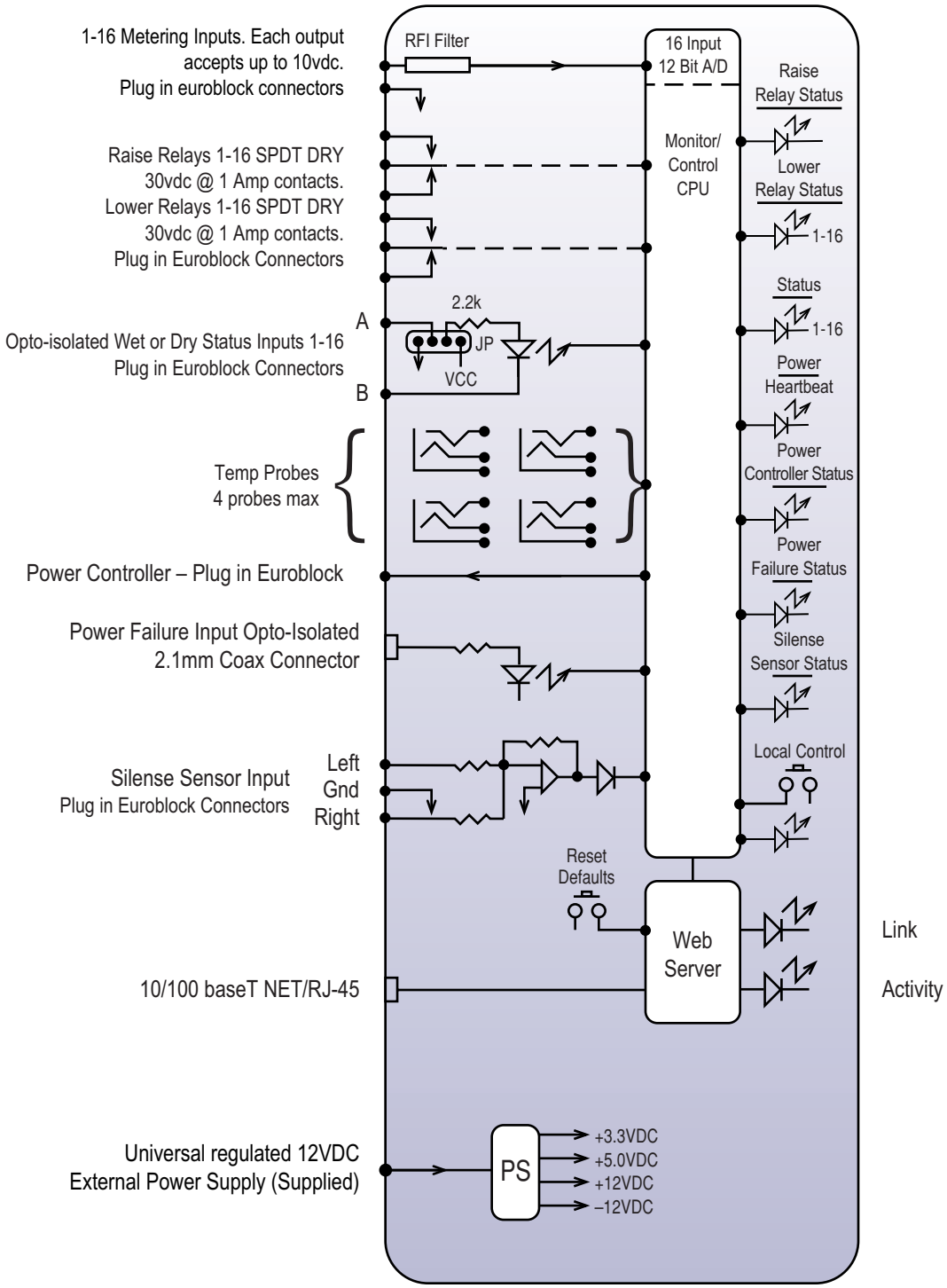
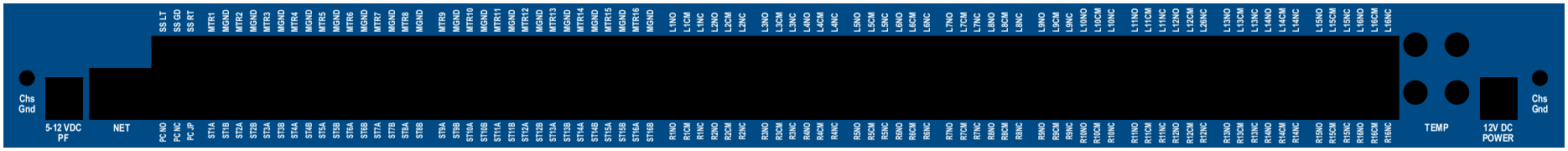
Functional Diagram




Chs Gnd
5-12 VDC PF
NET
SS LT
SS GD
SS RT
MTR1
MGND
MTR2
MGND
MTR3
MGND
MTR4
MGND
MTR5
MGND
MTR6
MGND
MTR7
MGND
MTR8
MGND
MTR9
MGND
MTR10
MGND
MTR11
MGND
MTR12
MGND
MTR13
MGND
MTR14
MGND
MTR15
MGND
MTR16
MGND
L1NO
L1CM
L1NC
L2NO
L2CM
L2NC
L3NO
L3CM
L3NC
L4NO
L4CM
L4NC
L5NO
L5CM
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L14CM
L14NC
L15NO
L15CM
L15NC
L16NO
L16CM
L16NC
PC NO
PC NC
PC JP
ST1A
ST1B
ST2A
ST2B
ST3A
ST3B
ST4A
ST4B
ST5A
ST5B
ST6A
ST6B
ST7A
ST7B
ST8A
ST8B
ST9A
ST9B
ST10A
ST10B
ST11A
ST11B
ST12A
ST12B
ST13A
ST13B
ST14A
ST14B
ST15A
ST15B
ST16A
ST16B
R1NO
R1CM
R1NC
R2NO
R2CM
R2NC
R3NO
R3CM
R3NC
R4NO
R4CM
R4NC
R5NO
R5CM
R5NC
R6NO
R6CM
R6NC
R7NO
R7CM
R7NC
R8NO
R8CM
R8NC
R9NO
R9CM
R9NC
R10NO
R10CM
R10NC
R11NO
R11CM
R11NC
R12NO
R12CM
R12NC
R13NO
R13CM
R13NC
R14NO
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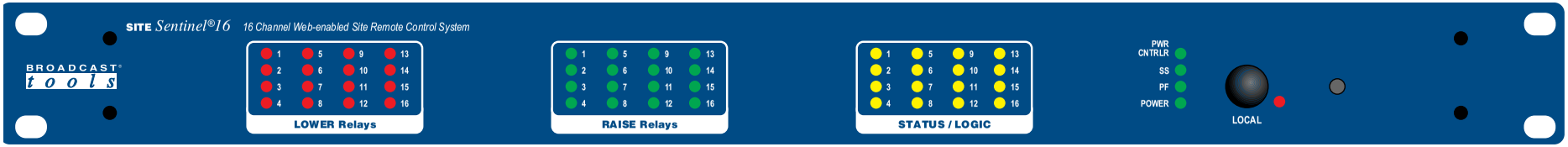
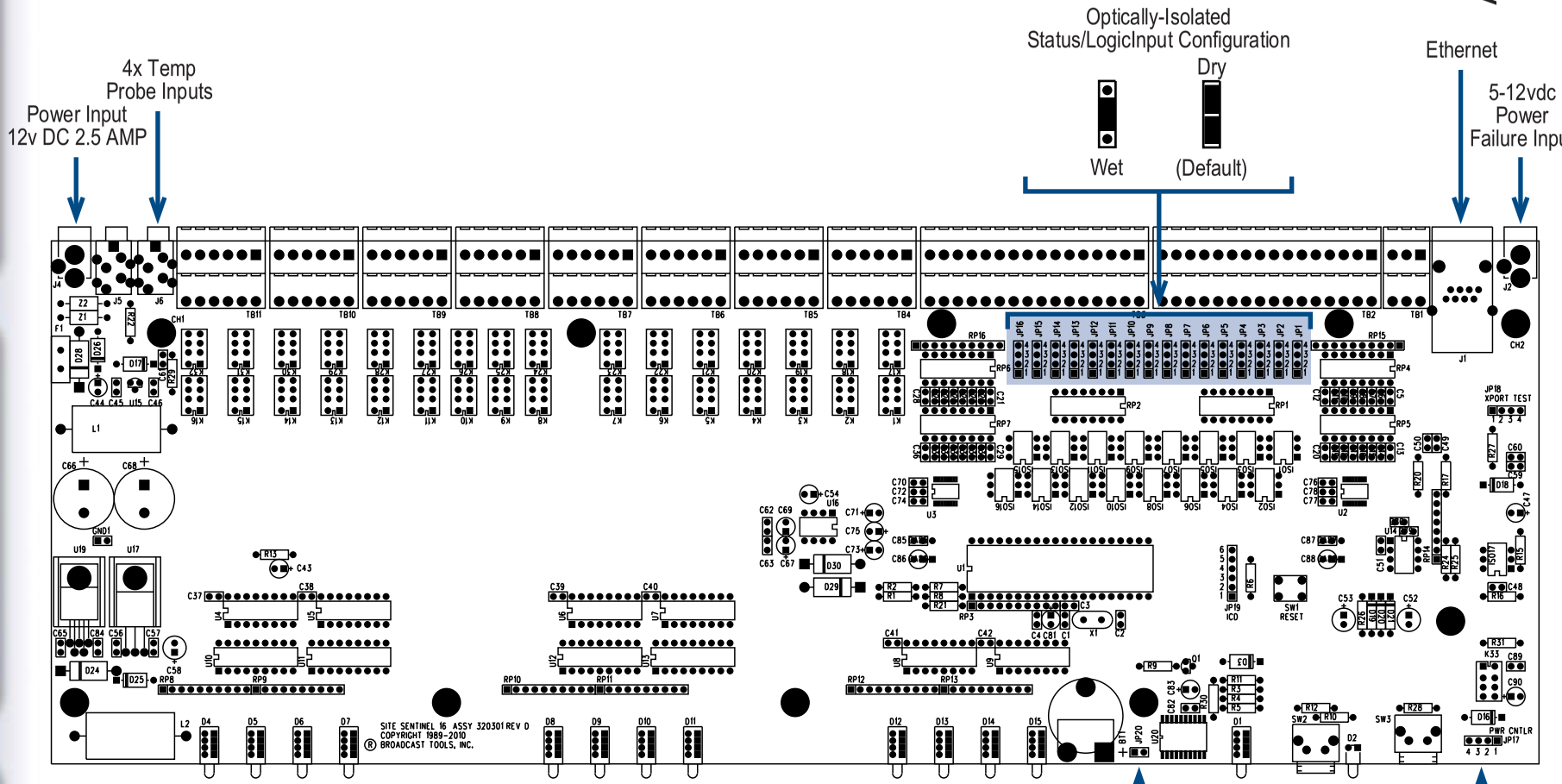
R16NO
R16CM
R16NC
TEMP
12V DC POWER
Chs Gnd


BROADCAST tools
SITE Sentinel®16
16 Channel Web-enabled Site Remote Control System
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
LOWER Relays
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
RAISE Relays
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
STATUS / LOGIC
PWR CNTRLR
SS
PF
POWER
LOCAL

SITE *Sentinel®16* JUMPER LAYOUT

16 Channel Web-enabled Site Remote Control System



JP 17 (Default) — TB-1-1 = N.O. / TB-1-2 = N.C. / TB-1-3 = gnd } Power Control Relay w/ 5dvc @ 100ma on wiper

JP 17 — TB-1-1 = N.O. / TB-1-2 = N.C. / TB-1-3 = wiper } Power Control Relay

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